

REMARKS/ARGUMENTS

Reconsideration is respectfully requested.

As to the Objections to Drawings:

In response to the continuing objections to the drawings and disapproval of the previously submitted FIGS. 3A-3B, Applicants respectfully add FIG. 6 to show the “distance between the counter electrodes.” No new matter has been added to FIG. 6 since FIG. 6 merely depicts two pixels, where each pixel is shown in FIG. 3A, and since it is well known by those skilled in the art that a liquid crystal display device comprises a plurality of unit pixels such as the two shown in FIG. 6.

As to the showing of the noise field direction formed between the gate bus line (such as element 2) and the pixel electrode (such as element 6'), it is respectfully submitted that the indicated direction of the noise field (and **the rubbing direction that corresponds to this noise field**) is shown as the **element 11** in **FIG. 3A** and new **FIG. 6**. This is described at least in the Specification page 10, lines 4-16 as shown below (**with emphasis added**):

Generally, the noise field 10 is formed between the data bus line 4 and the pixel electrode 6' or the counter electrode 8'. **Another noise field 11 is formed** between the gate bus line 2 and the pixel electrode 6' or the counter electrode 8'. When the rubbing is parallel to the gate bus line 2, the rubbing direction corresponds with that of the noise field 10 formed between the data bus line 4 and the pixel electrode 6' or the counter electrode 8'.

And, when the rubbing is perpendicular to the gate bus line 2, the rubbing is perpendicular to the gate bus line 2, the rubbing direction corresponds with that of the noise field 11 formed between the gate bus line 2 and the pixel electrode 6' or the counter electrode 8'.

For the reasons above, Applicants respectfully request approval of the amended FIGS. 3A-3B

and new FIG. 6 and withdrawal of the objections to the drawings.

As to the Claims:

Claims 1-14 are pending in the present application before this amendment. By the present amendment, Claims 1-2, 5-6, 9, and 13-14 have been amended. Claim 3 has been canceled without prejudice. No new matter has been added.

Objection for Containing Informalities

As to the objection to Claim 6 for reasons that the term “the distance” lacks antecedent basis, Applicant has amended “the distance” to --a distance-- to remove any issues surrounding this objection, and withdrawal of the objection is therefore respectfully requested. Nevertheless, Applicants respectfully disagree with the asserted reasons of this objection since the term “the distance” is merely an inherent feature of the elements recited in Claim 6. MPEP 2173.05(e) states that:

“Inherent components of elements recited have antecedent basis in the recitation of the components themselves. For example, the limitation “**the** outer surface of said sphere” would **not** require an antecedent recitation that the sphere has an outer surface.”

Rejection under 35 U.S.C. §11, ¶2

Claims 5, 9, and 14 stand rejected under 35 U.S.C. § 112, ¶2 as being indefinite.

In response, Claim 5 has been amended to depend from Claim 1 as this claim dependency has already been considered by the Examiner in the Office Action.

The term “no black” of Claim 9 has been amended to --no black matrix-- as suggested by the Examiner.

As to Claim 14, the dependency remains same so as to depend from Claim 13.

Nevertheless, typographical errors relating to the “gate” or “bus” data line have been amended in the claim. Withdrawal of the objection is respectfully requested.

The Examiner Interview on October 23, 2003

It is respectfully noted that an Examiner Interview was held with an attorney for the Applicants on October 23, 2003, in which the attorney over the telephone has verbally discussed with the Examiner the argued differences between the cited prior art references and the presently amended claims (which were faxed to the Examiner previous to the Interview). In particular, the prior art references do not relate to the fringe field mode of the liquid crystal display and do not teach the structure of the “V”-shaped slit structure. In the Interview, the Examiner has suggested further amendment to Claim 1 to further clarify the “planar” nature of the counter electrode and the “V”-shaped slit structure of the pixel electrode (i.e., incorporating the “first end” and “second end” of each V-shaped electrode). In response, appropriate amendments have been made incorporating the Examiner’s suggestions. No binding agreement was made or requested at the Interview since no formal amendment has yet been filed at the time of the Interview.

Rejection under 35 U.S.C. §102(e)

Claims 1-2, 5, and 10-12 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,256,081 (Lee). Claims 13 and 8 stand rejected under 35 U.S.C. § 102(e) as being anticipated by the Published U.S. Patent Application No. 2001/0001568 (Hiroshi). The “et al.” suffix, which may appear after a reference name, is omitted throughout this paper.

As to Lee, attached to this amendment is the Declaration Under 37 CFR 1.132 (signed by the CHOI and EOM who were the joint inventors with LEE of the Lee patent) that effectively removes the Lee reference from being a valid prior art reference. Even if Lee is considered, the presently claimed invention is still not anticipated by Lee (or Hiroshi).

As to the independent Claims 1 and 13, Applicants respectfully submit that none of the cited references, Lee and Hiroshi, teaches the now amended Claims 1 and 13, which have been amended to further limit the pixel electrode element: **--made from a plurality of V-shaped conductors, each having a first end and a second end, symmetrically arranged with the first end of each of the V-shaped conductors connected to each other by one continuous conductor and with the second end of each of the V-shaped conductors connected to each other by another continuous conductor, thereby forming a V-shaped slit between two symmetrically arranged V-shaped conductors--**.

In Lee, no slits are formed on its pixel electrode (FIG. 3, element 27). Just the opposite, the Lee's pixel electrode is comprised of a plurality of "bars" (i.e., FIG. 3, element 22a "first bar"; 27c "second bar"; 27e-1, "third bar"; 27e-2, "fourth bar"). Instead, arrangement according to FIG. 3 of Lee shows that the bars (elements 27e-1 and 27e-2) spreads out (without forming any slits) with one end of each of these bars connected to the elements 27a or 27c, together forming a T shape.

Hiroshi also fails to disclose, inter alia, the pixel electrode limitation of Claims 1 and 13. As can be seen in FIG. 3 of Hiroshi, the data electrode 48 are arranged such that a number of electrodes branch off the mid portion like a fishbone, and thus fails to teach the claimed pixel electrode having a plurality of "V"-shaped slits.

Rejection under 35 U.S.C. §102(b)

Claims 13 and 9 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,745,207 (Asada).

Asada also fails to disclose the claimed pixel electrode that has a “**V-shaped slit** [formed] **between two symmetrically arranged V-shaped conductors.**” Asada disclose a “pixel electrode” in FIG. 2, element 4, which appears to have a v-shaped portion of the conductors but Asada discloses no claimed V-shaped slit since Asada’s pixel electrode is open in one end, resembling a U-shape.

Rejection under 35 U.S.C. §103

Claims 1 and 3 stand rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,285,429 (Nishida) in view of Published U.S. Application No. 2003/0133068 (Suzuki).

Nishida fails to teach the claimed invention. Nishida shows V-shaped counter electrodes (12) overlapping also V-shaped pixel electrodes (15), but does not show the claimed pixel electrodes as shown in FIG. 3A where the ends of the V-shaped electrodes are connected to form a plurality of V-shaped slits. Nishida also fails to show the claimed counter electrode, which is plate shaped.

Suzuki does not teach the claimed counter electrode, which is rectangular plate shaped. Further, the preamble of the independent Claims 1 and 13 have been amended so that the pending claims are now limited to fringe-field switching (FFS) mode of the liquid crystal display design. In contradistinction, both the Suzuki and Nishida references are directed to in-plane

switching mode of the liquid crystal display design, which is substantially different from the FFS mode.

The presently claimed invention is directed to “A liquid crystal display device utilizing a fringe field switching (FFS) mode” as recited in the preamble of each claim. The fringe field switching (FFS) mode technology (which has been pioneered by Hyundai Display, predecessor in interest of the present assignee of this application) **simultaneously** provides the results of both the high transmittance and the wide viewing angle that are not generally provided by the conventional in-plane switching (IPS) mode, while keeping the liquid crystal director to rotate in-plane. The details of the FFS mode technology, in general, is described in the article, “A High Quality Fringe-Field Switching Display for Transmissive and Reflective Types” Journal of Information Display, Vol. 1, No. 1, December 2000, authored by Seung Hee LEE, Seung Ho HONG, Yeon Hak JEONG, and Hyang Yul KIM. The authors LEE and KIM of the “article” are also the joint inventors/Applicants of the present application having the U.S. filing date of December 4, 2001 and the priority date of December 5, 2000 (Korea). This “article” is submitted for the sole purpose of providing background, albeit not prior art, to support the benefits of the claimed FFS mode technology and the structural difference of the FFS and IPS mode.

The FFS mode technology provides numerous advantageous characteristics such as minimized crosstalk, improved viewing angle and color shift, and faster response time as they are well described in page 12 of the “article.” These advantageous characteristics are achieved by the structure of the electrodes arranged in a predetermined manner to form the fringe field in the liquid crystal layer.

As indicated in the Background of the present application (the Specification page 4, lines 10-11), a “conventional in-plane switching (IPS) mode also has the above-mentioned problems [of the prior art that are solved by the presently claimed invention].”

Thus, even if Suzuki and Nishida are combined, they (whether taken alone in combination) fail to teach or suggest, inter alia, the claimed invention that is directed to the FFS-mode of the liquid crystal display. Therefore, neither Suzuki nor Nishida, whether taken together or individually, cannot solve the problems that are solved by the presently claimed invention. In addition, neither Suzuki nor Nishida, whether taken together or individually, fails to teach or disclose the claimed counter electrode, which is plate-shaped.

In this regard, Applicants respectfully submit that the independent Claim 1 is in condition for allowance over the cited Suzuki and Nishida references.

Claims 4 and 6 stand rejected under 35 U.S.C. § 103(a) as being obvious over Nishida in view of Suzuki as applied to Claim 1 above, and further in view of in view of U.S. Patent No. 6,198,464 (Ota). It is respectfully submitted that Claims 4 and 6 are allowable at least since Claim 1, from which these claims depend, are considered to be in condition for allowance.

Allowable and Allowed Claims

Claim 7 has been allowed.

Claim 14 is indicated as being allowable if it is rewritten in independent form to include all limitations of the base claim and any intervening claims. In response, Claim 14 has been

amended to incorporate the limitations of Claim 13, from which it depends, so as to place Claim 14 in condition for allowance. Allowance of Claim 14 is therefore respectfully requested.

For the reasons set forth above, Applicants respectfully submits that Claims 1-2 and 4-14, now pending in this application, either has been allowed or are in condition for allowance. This amendment is considered to be responsive to all points raised in the Office Action. Accordingly,

Applicants respectfully requests a Notice of Allowance in the next action. Should the Examiner have any remaining questions or concerns, the Examiner is encouraged to contact the undersigned attorney by telephone to expeditiously resolve such concerns.

Respectfully submitted,

Dated: October 29, 2003

A handwritten signature in black ink, appearing to read "Richard J. Streit", written over a horizontal line.

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Attachment: Replacement Sheets of FIGS. 3A-3B.

New Sheet of FIG. 6.

Declaration Under 37 CFR 1.132 by CHOI and EOM.